

individuals pictured in cigarette advertisements. The latter are seen as attractive (by 69 percent), enjoying themselves (by 66 percent), well dressed (by 66 percent), sexy (by 54 percent), young (by 50 percent), and healthy (by 49 percent). There is no comparable data on how girl nonsmokers or young adult women view advertising (216).

Thus, advertisers have been successful in creating a sense of mystery, sophistication, and power around the behavior of smoking. Although smoking was once frowned upon for women, people now respond less negatively to a woman smoking (16). There is evidence that, for some women, smoking is linked with attitudes and behaviors that comprise a socially valued and successful self-image, and that giving up smoking is a threat to that image (123).

A majority of former smokers and nonsmokers of both sexes in the 1975 Adult Use of Tobacco Survey (194) agreed with the statement, "Cigarette advertising should be stopped completely." The percentages for men were 56.9 percent for nonsmokers and 56.4 percent for former smokers, and for women, 68.2 percent for nonsmokers, and 62.5 percent for former smokers. However, only 42.6 percent of male smokers and 42.5 percent of female smokers agreed with the statement. It appears that adult smokers value cigarette advertisements, but why they do—whether for information about brand characterization and availability, identification with the image portrayed, or some other reason—is not known. Fishbein concluded that cigarette advertising influences the decision to smoke as well as the choice of brand. Furthermore, he points out that cigarette advertising may serve as a discriminative stimulus for smoking behavior. Advertising can influence the initiation of smoking, the choice of brands smoked, and the level of consumption. Commenting that the tobacco industry asserts that advertising serves only to influence brand choice and not initiation or consumption, Fishbein maintains that it is somewhat unrealistic to assume that an advertisement which can do one of these things is not also capable of doing the other. While additional research on the effects of cigarette advertising is clearly necessary, this review suggests that cigarette advertising does affect cigarette consumption (63).

Restrictions have now been placed on advertising in many countries in the world, including the United States. There is no uniform agreement that the ban on televised cigarette advertising in the United States and the United Kingdom significantly reduced consumption. However, it is generally believed that each action of this sort—including the U.S. Surgeon General's Reports and the Reports of the Royal College of Physicians, as

well as other smoking control measures such as taxation and legislation—has a cumulative effect on per capita consumption (8,142,202).

THE FAILURE TO DISSEMINATE INFORMATION

Many of the critical evaluations of public health campaigns conveying anti-smoking information maintain that little attitudinal or behavioral change is ever effected (188). Fishbein (63) argues that there is insufficient information describing the complex relationships between cigarette smoking behavior and beliefs, attitudes, and intentions to make this conclusion. He further maintains that it is necessary to know to what extent decisions regarding initiation, reduction, increase or cessation are under attitudinal (individual, personal) or normative (society-influenced) control. The importance of personalizing the health message, and the failure of the public to personalize the health messages that they have received is emphasized. For example, over 80 percent of smokers agree with the statement that smoking is hazardous to health. However, on the question, "Are you in any way concerned about the possible effects of cigarette smoking on your health?" only 25 percent of current smokers in the 1975 NCSH survey stated that they were "very concerned," another 22.6 percent were "fairly concerned," 18.9 percent were "only slightly concerned," and a final 31.9 percent were "not concerned" (194). Fishbein maintains that the public is not effectively informed about the general danger to health posed by smoking and is even less informed about the connection with specific diseases. He concludes that the content of an effective message is fourfold: that continued smoking leads to negative outcomes; that stopping smoking leads to positive outcomes; that personal relevance must be established; and that normative influences must be appealed to by maintaining that significant others think an individual should quit.

Stress at Work

A general model of stress at work (38) is worthy of consideration. Examination of the sources of stress at work (Figure 2) reveals a number of items that are especially salient for women. Discrimination against women in employment, role conflict, authority problems, inequity in promotions, exclusion from decision-making processes and the "old boys" network have been frequently discussed (68). Individual characteristics may be considered from a gender viewpoint as well; for example, some types of psychological disorders, such as anxiety and de-

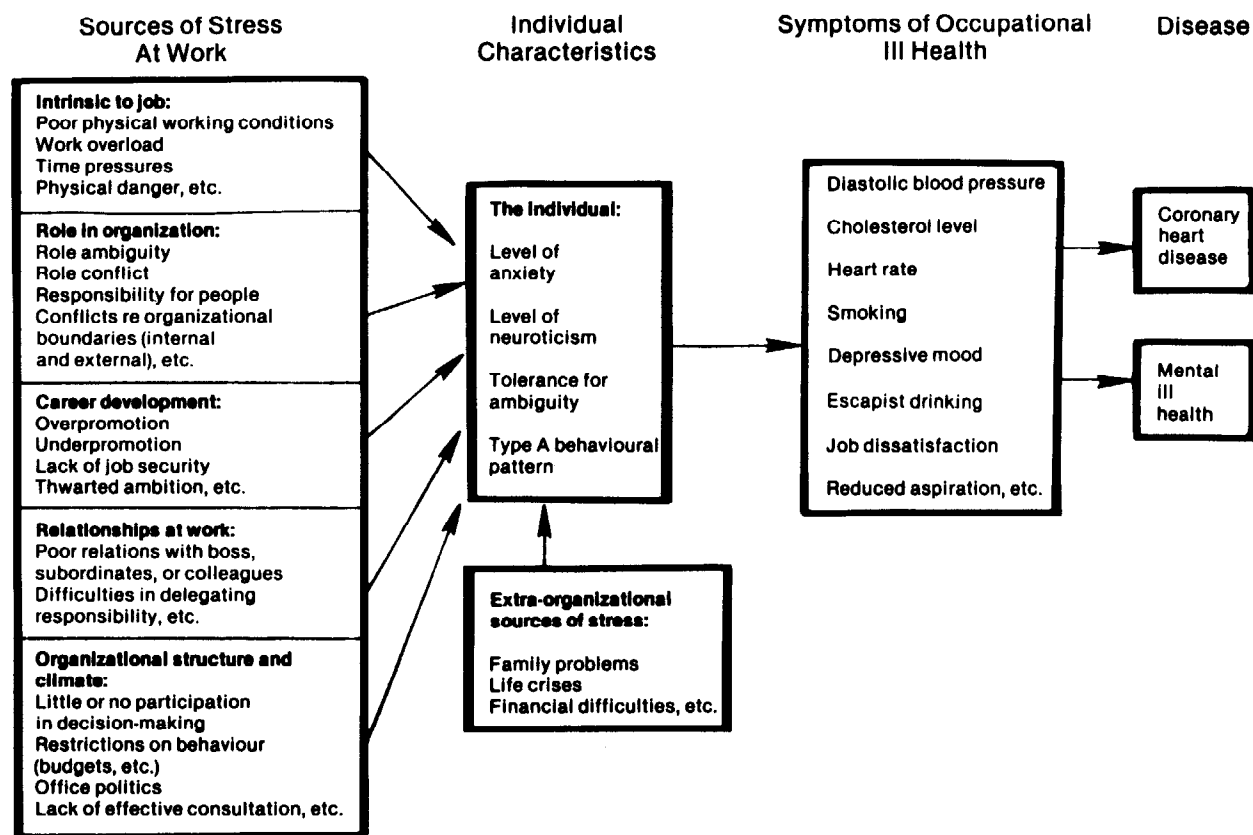


FIGURE 2.—A model of stress at work

pression, are more prevalent among women than men (48,68). The Type A behavior pattern, which is associated with male cardiovascular disease, has been shown to be unrelated to sex once socioeconomic status is taken into consideration (172).

An additional set of stressors originates in the extraorganizational environment. A prospective study of the relationship of employment status and employment-related behaviors to coronary heart disease (CHD) incidence was conducted by Haynes and Feinleib (91). Working women scored higher on scales measuring daily stress, marital dissatisfaction, and aging worries than men. They were also less likely to display overt anger than either homemakers or men. While incidence rates of coronary heart disease in working women were not significantly higher than in homemakers, an excess risk of CHD was identified among women who were employed in clerical jobs and had children. The risk factors for CHD in this group included family responsibilities, suppressed hostility, a nonsupportive supervisor, and low job mobility over the preceding 10-year period.

Smoking Habits of Health Professionals

There are relatively few studies available which present gender-specific smoking rates in various professions. Health professionals were selected for analysis because they were more likely to be aware of the health consequences of smoking than the general public; this group has also been studied more extensively.

PHYSICIANS

The smoking habits of male and female physicians in five nations are presented in Table 15. Smoking rates in the general population are provided for comparison when supplied by the authors. No breakdowns by gender are available for the United States. Separate estimates of smoking rate in a small group of women physicians age 36 to 46 at the time of survey (205) and in a large sample of predominantly male (93 percent) physicians (195) are listed in the table. In addition, the wives of 3,990 physicians were queried about their own smoking habits and those of their husbands; no information is provided on the occupations of these women (77).

Examination of the table shows that smoking rates of physicians, both male and female, tend to be much lower than general population rates. The only exception is the higher rate of current smokers among female physicians in Finland (200). The percentage of current smokers among the sample of U.S. female physicians is higher than that reported in other

TABLE 15.—Smoking habits of male and female physicians in selected countries

Author	Country	Number	Percent Smokers								
			Never		Pop. Est.	Current		Pop. Est.	Former		Pop. Est.
1. Bourke, et al., 1972 (22)	Ireland	M 1359 F 221	17.9 51.5	— 53.9	19.7* 26.7	48.5 —	67.6* 38.6*	33.6 22.2	— —	12.7* 7.5*	
2. Vuori et al., 1971 (200)	Finland	M } F } 843	38 66			34 26	60 20	27 8			
3. Wilhelmsen & Faith-Ell, 1974 (210)	Sweden	?	33 54			38 27		29 19			
4. Aaro et al., 1977 (1)	Norway	M 740 F 398				35.3 21.7	— —	53* 36*	37 ¹ 38 ¹	— —	27 ¹ * 20 ¹ *
5. Westling-Wikstrand et al., 1970 (205)	USA	F 81	42			35.8			13.6		
6. Greenwald et al., 1971 ² (77)	USA	M 3990 F 3990	32 ³ 35 ³			24 36			43 ³ 27 ³		
7. USDHEW, 1976 (195)	USA	M 3657 ⁴		21		39		64 ¹	43 ¹	34 ¹	

*Significant difference between percentages paired by (—).

¹Stopping rate = $\frac{\text{former smoker}}{\text{ever smoker}}$

²Sample consisted of physicians and their wives whose profession was undefined.

³Percentages estimated from graph, not specified in text.

⁴Approximate total of M and F, estimated to be 93% male.

countries and approaches the rates in the general population (205). Prevalence of smoking has a strong relation to demographic variables such as profession, income, and education. We would expect physicians to be in the highest category on each of these variables and, therefore, to have lower prevalence rates. Therefore, it would be relevant to examine the cross-tabulations for smoking prevalence by socioeconomic status, according to sex.

According to the three studies providing comparative data, both female and male physicians are quitting at rates higher than the general population. The percentage of former smokers among female physicians, and estimates of quit rate, are lower than among male physicians in all but one of the studies listed. This trend may represent a time lag in the smoking behavior of women as compared to that of men, or there may be a lower quit rate among women physicians.

In two studies, female physicians smoked more cigarettes per day than women in the general population (1,22). In contrast, wives of physicians smoked fewer cigarettes on the average than their husbands (77). A greater percentage of the wives of physicians than physicians themselves were smokers in every age group except the oldest. The percentage of current smokers appeared to be inversely related to age in the group of wives, but virtually stable across age for the physician-husbands. Husbands and wives tended to have similar smoking habits.

Based on a small sample of women graduates of a single U.S. medical school, Westling-Wikstrand, et al. (205) reported that 58.8 percent of the current smokers belonged to the category "professor" (academic appointment of assistant professor or above, with or without board attainment) when ranked on professional attainment. The other categories were "boards" (specialty board certification but not professional appointments), "no boards" (in practice without board certification or professional appointment), and "not in practice." The "professor" group was characterized by greater likelihood of being single and having fewer "habits of nervous tension." Compared to other groups, this group had the lowest depression scores, average anger scores, and the highest anxiety scores. The authors comment that this group of women was the most similar to their male colleagues. They may also have experienced fewer problems with ambivalence about sex roles, self-image, or conflict over aggressive behavioral patterns. The presence of the high anxiety scale, however, casts some doubt on this generalization.

Women in U.S. medical schools are subjected to significant psychological pressures and often experience emotional problems and lack of confidence about achieving the goal of gradua-

tion (205). Female physicians also experience significant role conflict (19).

The relevance of indices of stress to smoking patterns is again one of inference. If smoking serves as a coping mechanism—a means of reducing negative affect—then it is understandable that female physicians, or any other professional with elevated stress levels, would have higher current smoking rates than the general populace. It is also understandable that they might experience more difficulty in quitting.

PSYCHOLOGISTS

A survey of psychologists in California state universities and colleges found that female psychologists were much more likely to smoke than their male colleagues (46). The rate of smoking was slightly higher than in male health professionals, and approximately the same for female psychologists (38 percent) and nurses (195) (see Table 16).

This smoking rate is significantly above the rate among professional women in general (25.6 percent) and was due to lower cessation rates among psychologists rather than higher initiation rates. The most common reasons given for smoking are the stress of work or school, and personal stress. Frieze, et al. state that professional women have to exhibit “male-like” characteristics in order to survive in their jobs, but that these characteristics are often met with criticism and hostility (67). Thus, social and occupational demands are at odds with each other. Furthermore, there is evidence that female psychologists face very real sex discrimination in the evaluation of their work (67).

Dicken and Bryson (46) report a high degree of power fantasies among female psychologists who smoke. This supports Fisher's finding that female smokers in general seem preoccupied with the issue of power (64). He speculates that cigarettes are used defensively against feelings of powerlessness, weakness, and inferiority.

Elevated suicide rates are another correlate to the evidence of excessive stress and difficulty in coping experienced by some female professionals. These higher rates, compared with the general female population, have been observed among women psychologists, chemists, and physicians (124,164). Factors such as ambivalence about success, role conflict and marginality were offered as dynamics. However, it is not possible to determine whether these higher suicide rates are due to the self-selection of suicide-prone women into these and possibly other professions, or to the difficulties encountered in professional training and practice (or to an interaction of both).

NURSES

A number of studies have shown a higher rate of smoking among nurses than in the general female population in the United States. The most recent assessment of nurses' smoking behavior was conducted in 1975 (199). In Table 16, smoking habits of nurses are compared with those of adult U.S. women and other groups of health professionals.

Between 1969 and 1975, the proportion of nurses who were current smokers rose from 37 to 39 percent. Every other category of health professional (physician, dentist, and pharmacist) had substantially reduced smoking rates. The membership of these three professions is predominantly male and current smoking rates vary from 21 to 28 percent. If one examines quit rates in 1975 among the four categories of health professionals, it is clear that the majority of physicians, dentists, and pharmacists who ever smoked cigarettes have quit: 64, 61, and 55 percent respectively. Among nurses, only 36 percent have quit, which does, however, compare favorably with adult women (34 percent) and working women (30 percent) (199).

Noll surveyed smoking behaviors of nurses by work setting (see Table 17) (135). The overall percentage of current smokers in this survey was 37 percent, compared to a national average (for 1966) of 33.7 percent in women. There was a smaller percentage of never smokers (41.3 percent) among nurses in that survey than among the female population (56.8 percent), suggesting a higher quitting rate at that time as well. From Table 17 it appears that there is no selective recruitment into the various nursing specialties; the proportion of never smokers is fairly equal across work settings. Differences do appear, however, in the proportion of current smokers according to work setting. Highest rates of smoking are found in psychiatric and pediatric settings, and lowest rates in the four categories connected to education and community involvement: nursing education, working in the community, elementary or high school nursing, and working in a doctor's office.

In Great Britain, only 26 percent of maternity nurses smoked regularly, compared to 37 percent of those in general nursing (106). In the United Kingdom, approximately the same proportion of nurses smoke as women in the general population — 44 percent (106,154).

Knopf Elkind reports differences in smoking among different types of ward nursing staff. Trained nurses had 41 percent current smokers, learners had 28 percent, nursery nurses had 14 percent, and auxiliaries had 61 percent current smokers (106).

Lampman reported a similar excess of smokers among nurses

TABLE 16.—Percentages of cigarette smokers (S), former smokers (FS), and ever smokers (ES) and cessation ratio (FS/ES) among psychologists, nurses, and other selected health professionals

Sample	N	S	FS	ES	FS/ES
Male and predominantly male samples					
CSUC male psychologists	258	28	35	62	55
Eminent experimental psychologists—90% male (Lawton and Goldman, 1961)	72	53	11	64	17
Psychiatrists —% male not reported (Tamarin and Eisinger, 1972)	309	42	27	69	39
American Public Health Association male members (Eyres, 1973)	3,569	21	40	61	66
Physicians—93% male (USPHS, 1977)	3,657	21	42	63	67
U.S. adult males (USDHEW, 1976)	5,702	39	29	69	42
Female and predominantly female samples					
CSUC female psychologists	86	38	19	57	33
American Public Health Association female members (Eyres, 1973)	1,973	31	31	62	50
Nurses—98% female (USPHS, 1977)	2,429	39	22	61	36
U.S. adult females (USDHEW, 1976)	6,327	29	14	43	33

NOTE: CSUC = California State University and Colleges.

SOURCE: Dicken, C. (46).

TABLE 17.—Cigarette smoking status by work setting for nurses (percent)

Work Setting	Cigarette Smoking Status			Total*	
	Current	Former	Never	Percent	N
Surgical Units	41.2	19.4	39.4	100.0	529
Medical Units	37.8	18.2	43.9	99.9	476
Operating, Labor, Delivery					
Emergency Room	39.8	15.2	45.0	100.0	485
Maternity Unit	36.2	17.2	46.6	100.0	197
Pediatrics Unit or Setting	46.6	8.8	44.6	100.0	80
Psychiatric Unit or Setting	49.9	18.2	32.0	100.1	135
Nursing Education Setting	24.6	26.8	48.7	100.1	90
In the Community	26.1	33.4	40.6	100.1	264
Elementary or High School	27.5	36.4	36.1	100.0	217
Doctor's Office	24.2	33.8	41.9	99.9	338
Out-Patient Clinic	42.5	15.1	42.5	100.1	113
Other and Mixed	41.3	18.4	40.3	100.0	1,078

*Total N = 6,012

SOURCE: Noll, C.E. (135).

aides (95.2 percent female) in a large metropolitan hospital in the United States (110). Fifty-two percent of that group smoked, compared with 36 percent of the medical nurses (99.3 percent female) and 40 percent of the student nurses (95.6 percent female). This survey was aimed at identifying smoking within the hospital. Thus, true prevalence in this sample can only be higher.

Compared to other female health professionals (see Table 16) in the United States, nurses' quit rates are above some (psychologists, U.S. adult women) and below others (American Public Health Association female members). Knopf Elkind points out that in the British population other female-dominated professions, such as primary school teachers, health visitors and domiciliary midwives, have noticeably lower rates of smoking than hospital nurses (106). Entry into the profession of nursing is associated with taking up daily smoking but the degree of occupational stress in a population of 300 British student nurses was not different for smokers and nonsmokers (92). This finding does not rule out the use of smoking as a stress-reduction mechanism, however.

Other factors which might contribute to a high smoking rate among nurses are work overload and frustration in professional relationships with physicians.

Knowledge of health consequences of smoking is high among nurses, but it has been shown that student nurses are less well-informed than medical students (154). Nurses who quit smoking

do cite protection of future health as a major reason (75,92). Nurses who smoke are less likely than nonsmokers to agree that not smoking is a preventive measure against cancer (106). Similar refusal to acknowledge health risks of smoking is found among smokers in the general population (194). Whether this represents a real lack of knowledge or a method of reducing cognitive dissonance through denial is unknown. The problem is particularly critical for nurses (and other health professionals) since they serve both as exemplars and as providers of information (106).

The Pregnant Smoker—a Special Target

The pregnant woman is in a unique life situation. Every substance she ingests and every behavior that she manifests can affect the present and future health status of the fetus she is carrying. If she smokes, the nicotine, carbon monoxide, and hydrogen cyanide which she inhales all cross the placental barrier and enter the bloodstream of the fetus. The risk factors for both mother and fetus have been extensively reviewed elsewhere in this volume as well as in previous reports from the Surgeon General (198). (See also Pregnancy and Infant Health in Part II of this Report).

It is estimated that between one-quarter and one-third of pregnant smokers quit smoking for the duration of pregnancy and that another third cut down.

This section reviews the current literature on sources of information available to the pregnant smoker, summarizes available data on prevalence of current smoking and smoking cessation during pregnancy, and discusses the problem of cessation from a behavioral viewpoint.

SOURCES OF INFORMATION

The same classes of information discussed in the previous section are available to the pregnant smoker. How the pregnant smoker uses these sources and her degree of confidence in the information provided seems to be a function of socioeconomic status and parity. Information is distributed through health professionals (primarily physicians and nurses), peers and family, community resources, and the media.

Women in lower socioeconomic classes tend to rely more on lay referral systems, such as peers and family, than upon mass media or medical sources (10,74). Personal transmission of information seems to be more highly valued and readily adhered to (71). Middle and upper class women are more likely to utilize

impersonal sources such as mass media and physician-supplied information (74).

In one study of predominantly working class British women, the mode of exposure to smoking information ranked as follows: 84 percent had seen it on television; 65 percent were told by family or friends; 52 percent had seen posters and leaflets; 37 percent had been told by husbands; 34 percent used books and magazines; and 25 percent had been told by a medical source (16 percent from a doctor, and 9 percent from a nurse) (11). The authors comment that television, posters, and leaflets are inadequate for the delivery of statistical information; books, which are better sources, were used much less than these other sources. Baric and MacArthur present a discussion of health norms in pregnancy (10). Seventy-nine percent of the sample were aware of some norm relating to smoking in pregnancy: 39 percent thought they were expected not to smoke at all, and an additional 40 percent thought they were expected to reduce their smoking. All of the women could name at least one source of information; 98 percent had been exposed to mass-media messages to quit smoking. Smoking seemed to be undergoing a change in norm status, from generality to specificity, i.e., from being a general health menace to one with specific consequences, such as a threat to the health of the baby.

The issue of normative behavior in smoking and personalization of message should be crucial to informational campaigns, according to Fishbein's theory (63). Social support from a spouse should also be critical, as would be involvement of significant others.

Women about to have their first baby are more likely to believe educational materials than multiparous women (11,50). This finding suggests that different modes of intervention or different emphases should be developed for primiparous and multiparous women.

Physician Advice

The physician represents one of the most knowledgeable figures the pregnant woman will encounter as a source of information. Consequently, estimates of the frequency with which the physician delivers advice on smoking are of importance.

Three such estimates are available from national samples in the United States. In the first study, conducted in the mid-1960s, 37 percent of physicians reported that they advised all or almost all (95 to 100 percent) of their pregnant patients to quit smoking or cut down sharply. Obstetricians were more likely to deliver such advice to pregnant patients (49 percent) than were physicians in general practice (38 percent) (76).

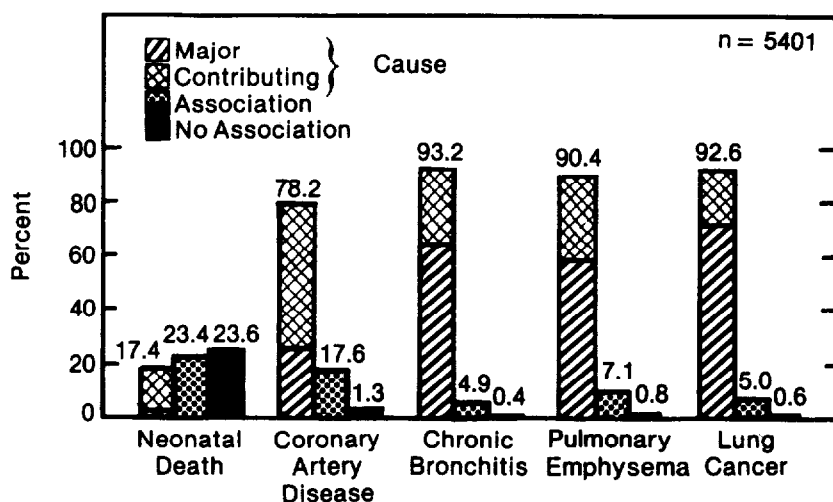


FIGURE 3.—Beliefs of OB-GYN specialists about the association of maternal smoking with neonatal death and other selected diseases

SOURCE: Danaher, B.G. (40).

The Physician Advice Survey conducted by the Center for Disease Control examined the beliefs and behavior of physicians specializing in Obstetrics and Gynecology (OB-GYN) in the United States (40). The OB-GYN specialty practice includes preventive medical care in the form of specific suggestions regarding hygiene and family planning and, during pregnancy, active participation in directing perinatal care (40). The beliefs of OB-GYN specialists about the relationship between maternal smoking and neonatal death are presented in Figure 3, along with their belief about some of the more common diseases associated with smoking. Because neonatal death can result from a great many factors, the attribution of causality is somewhat lower than for the other conditions represented. However, it is notable that 23.6 percent of the physicians deny the existence of any relationship. Congruent with the estimate from the 1960s, 45.3 percent of OB-GYN specialists in this survey claimed to instruct all or almost all of their patients to quit or cut down on smoking (see Figure 4). Another 13.1 percent delivered such advice to most or many (65 to 95 percent). A noticeably smaller fraction of physicians who are current smokers deliver this message than ex-smokers or nonsmokers.

The 1975 Survey of Adult Use of Tobacco, sponsored by the National Clearinghouse on Smoking and Health, included a

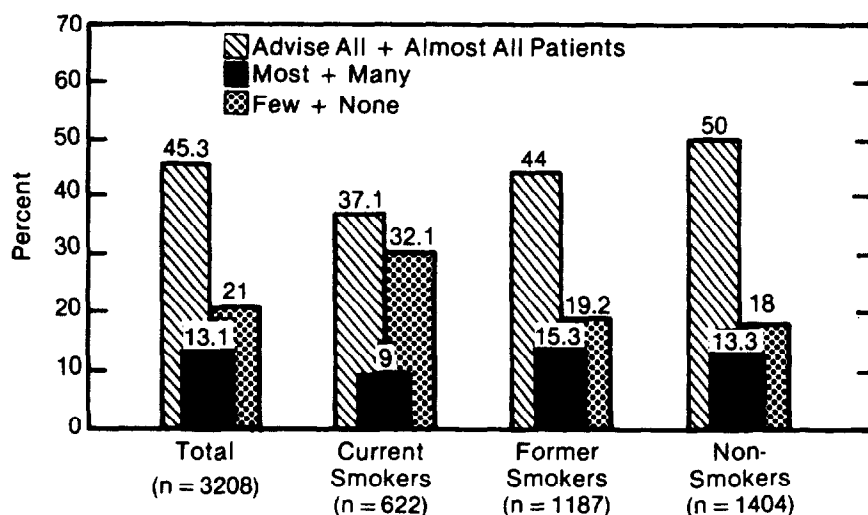


FIGURE 4.—Percentage of patients advised to quit or cut down their smoking by the smoking behavior of the advising obstetrician-gynecologist

SOURCE: Danaher, B.G. (40).

questionnaire directed at smoking habits in pregnant women. A preliminary analysis of the results has been made (89). Out of 12,029 respondents interviewed in 1975, a total of 1,225 women (814 current smokers and 411 former smokers) were administered questions about their smoking habits during pregnancy.

Each of the 983 respondents (664 current smokers and 319 former smokers) who had ever been pregnant was asked whether her doctor suggested that she quit smoking or cut down during her last pregnancy. Table 18 displays the results by year of last pregnancy. The percentage of women reporting such advice from their doctors rose steadily. Only 14.6 percent of women who had last been pregnant from 1965 to 1969 claimed to have been advised by their doctor either to stop or cut down; 23.7 percent of women last pregnant from 1970 to 1975 remembered such advice. These estimates are considerably smaller than those supplied by physicians themselves (40,76). There are several possible explanations for the discrepancy: the women were reporting retrospectively, and memory may have been distorted; a selective under-reporting of advice may have occurred; or the populations of physicians and patients may be entirely nonoverlapping. Retrospective data have been shown to be unreliable in one pregnancy study (49). Unfortunately, sample sizes were too small to provide reliable estimates of the per-

TABLE 18.—Distribution of responses of current former smokers who were ever pregnant to the question “Did your doctor suggest that you cut down or stop smoking cigarettes during your last pregnancy?”

Physician's Advice	Percent by Year of Last Pregnancy			
	(Prior to 1965)	(1965–69)	(1970–75)	(1965–75)
Quit smoking	5.6	6.2	10.8	9.3
Cut down smoking	5.7	8.4	12.9	11.4
No advice given	70.5	64.1	65.6	65.1
Not smoking at the time	16.4	20.6	9.1	12.9
Had no doctor	0.5	0	0.2	0.1
Don't know or no answer	1.3	0.8	1.3	0.9
Number of respondents	466	215	291	506

SOURCE: National Clearinghouse for Smoking and Health (194).

centage of women who followed the advice of a physician to stop smoking during pregnancy. Such data might have yielded an estimate of the effectiveness of such advice.

In sum, over 50 percent of physicians claim to advise their pregnant patients to eliminate or sharply curtail their smoking during pregnancy, but a much smaller percentage of pregnant women recall such advice.

PREVALENCE OF SMOKING AND QUITTING DURING PREGNANCY

The prevalence of smoking in pregnant women (before special cessation efforts) should be roughly equivalent to the prevalence of smoking in the female population in the same age range, corrected for socioeconomic status. Ten studies conducted in developed countries, reported between 1971 and 1973, show a range from 23.4 percent to 47.6 percent in prevalence of tobacco use (145). The median rate is 42.75 percent smokers for the entire sample. A survey (conducted during the course of the pregnancy) of 9,553 pregnant women who represent a cross section of the general population in the Riverside-San Bernadino-Ontario (California) area was recently completed (108). Preliminary results indicate that 44.5 percent of all women surveyed either continued to smoke during pregnancy or had smoked before, but not during, this pregnancy. Since the precise time of cessation is not clear, a more conservative estimate is that 33.3 percent of women continued to smoke for the duration of their pregnancy. This estimate is well within the range of those derived from the Population Report analysis (145).

There is a paucity of race-specific information on smoking prevalence during pregnancy. Niswander and Gordon (134), in a study encompassing 14 U.S. cities, reported greater prevalence of smoking among white than black women (53.65 percent vs. 41.85 percent, respectively). This is a high estimate and reversal of the prevalence rates presented in Table 7. The finding is similar to the previously presented data, in that white women smoked more cigarettes per day than black women: only 3.3 percent of black women smokers consume a pack a day or more, compared to 13.4 percent of white women in this study. Smoking is slightly less prevalent in black than in white women in the sample of Kuzma and Phillips (108): 57.3 percent of black women and 53.3 percent of white women have never smoked. For Hispanic women, the percentage is somewhat higher, 61.9 percent never-smokers. Table 19 summarizes the results of 11 studies reporting rates of discontinuing smoking during pregnancy. The overall rate of cessation among regular smokers ranges from 0.9 percent to 35 percent, which is the figure most often anecdotally cited. The median is closer to 20 percent.

Only one study provides ethnic data on smoking cessation during pregnancy (108). In this study, it should be remembered, stopped smokers are women who smoked prior to, but not during the pregnancy, so that quitting may not have been pregnancy-specific. Rates are very similar for white, black and Hispanic women: 24.5 percent, 24.9 percent and 28.7 percent, respectively, were stopped smokers in this study.

Even acute abstinence from cigarette smoking may be of value, if it occurs immediately prior to giving birth. In the United Kingdom, women are often admitted as early as 48 hours before elective delivery; abstaining from smoking for that period of time was found to result in a net percent increase in available oxygen as COHb was excreted (42). Such a temporary benefit may actually be critical under acutely stressful conditions, and where there is chronic placental insufficiency.

Cutting down on smoking during pregnancy would appear to be better than no change in behavior, especially for those adverse effects upon the fetus which show a dose-response relationship. However, cutting down on number of cigarettes does not always imply a reduction in delivered dose of nicotine or other tobacco smoke constituents (79,80). When smoking behavior was measured over the course of pregnancy in regular smokers (5 to 30 cigarettes per day for at least 5 years), a decrease in number of puffs per cigarette occurred as pregnancy progressed (6). Like puffing rate, the COHb concentration also decreased over time in pregnancy. However, in these subjects there was no significant change in nicotine dose extracted from

TABLE 19.—Percentage of current smokers who altered smoking behavior during pregnancy

Author and Date	N	Change in Smoking Habit—Percent of Women					Miscellaneous, or Comment
		Quit	Quit Temporarily	Cut Down Only	Increased	No Change	
1. Kullander & Kallen, 1971 (107)	2,806	0.9	1.3			97.3	+0.5 Initiated
2. Andrews & McGarry, 1972 (4)	6,733	14.7					Maternities only
3. Butler et al., 1972 (29)	341	18.4					Quit by end of 4th month
4. Schwartz et al., 1972 (171)	1,188	31.0		10.0			
5. Baric et al., 1976 ¹	134	14.9	3.0			82.1	Quit by 1st ante-natal visit
6. Graham, 1976 (74)	50	33.3*		33.3*		33.3	*1/3 quit or cut down; 1/3 cut down temporarily
7. Baric & MacArthur, 1977 ¹ (10)	133	22.5	6.0	33.1	5.3	26.3	+6.8 reduced temporarily
8. Donovan, 1977 (49)	959	12.5	5.6				
9. Yankelovich et al., 1977 (216)	?	35.0		32.0			

TABLE 19.—Percentage of current smokers who altered smoking behavior during pregnancy—Continued

Author and Date	N	Change in Smoking Habit—Percent of Women					Miscellaneous, or Comment
		Quit	Quit Temporarily	Cut Down Only	Increased	No Change	
10. Harris, 1979 (89)	409 ²	26.5		24.8	7.9	36.9	+3.9 changed brand or switched to filter cigarettes 82.2 of quitters resumed smoking after delivery
11. Kuzma & Phillips, 1979 (108)	4,249	25.1 ³					13.4 of quit smokers were again smoking at 1–5 mo. post-delivery

NOTE: ¹These two studies may be composed of overlapping samples.

²Of the 506 women in the NCSH survey whose last pregnancy occurred during 1965–75, 409 reported smoking either before or during pregnancy.

³Percent who smoked prior to, but not during this pregnancy, calculated as part of smoker sample.

the cigarette over the duration of the pregnancy. Some alteration in puffing pattern, presumably in inhalation, produced the compensation. Thus, caution must be exercised in the interpretation of "cutting down."

There is even less information available on the percentage of quit-smokers who return to smoking after delivery. Table 19 provides two extremely divergent estimates: 82.2 percent (89) and 13.4 percent (108). Because we are dealing with relatively small sample sizes, the reliability of such data is not very high. Much more information must be accumulated before any firm statements about recidivism can be made. Women who quit during pregnancy have an excellent opportunity to change a behavior for life, with benefits both to themselves and to their children (see Recommendations).

PSYCHOSOCIAL FACTORS IN QUITTING

Health reasons, primarily centering around preventing harm to the fetus, are most often given as reasons for quitting. Yankelovich, et al. (216) report that 62 percent of young women smokers believe that smoking can harm the fetus and norms against smoking have been discussed (10). The sickness experienced as a part of pregnancy can also be a reason to give up smoking (11). It has also been reported that women who smoke before pregnancy show a significantly increased incidence of appetite cravings and aversions, which may be associated with quitting (41).

A closely related aspect of maternal health is weight gain. Preventing excessive weight gain has even been given as a reason to continue smoking during pregnancy (50). Baric and MacArthur included control of weight gain as a norm during pregnancy; 24 percent of this sample expressed awareness of social expectations in this area (10). The issue of how much weight it is appropriate to gain in pregnancy varies according to time and culture, so the generality of this finding is unclear.

Little is known about problems in quitting during pregnancy. The role of cigarettes as stimulants or tension reducers may be altered during this period. Abstinence symptomatology has also not been documented.

A composite picture of the successful quitter has been drawn by Baric, et al. and also by Kuzma and Phillips (11,108). Baric, et al. list educational qualifications as being positively related to quitting, followed by sickness in early pregnancy. Other distinguishing characteristics are smoking fewer cigarettes before pregnancy (also see 49,171), having started smoking at an older age, having stopped previously for at least 6 months, having

heard about harmful effects of smoking from more sources, firmly believing that smoking was harmful to the baby, and finally, being encouraged to stop or being joined in the cessation effort by their husbands (47,166).

Kuzma and Phillips identified a number of similar characteristics: higher educational level; greater family income; being married; being employed; more frequent church attendance; having a spouse who does not smoke; and no illicit drug use (106,108).

The characteristics described—advanced educational level, higher socioeconomic status, wider information base, belief in stopping for the sake of the fetus, and spousal support—all fit with a model of behavior change involving information, personalization, and social norms (63).

Three studies evaluate smoking cessation interventions for pregnant women (11,41,49). Tables 9 and 10 show reported abstinence figures for two studies. One study (11) showed no difference between intervention and control groups, and the second study (41) showed 50 percent abstinence at 9-month follow-up for those completing treatment (11,41). This latter result is very encouraging but is based on a very small sample in an affluent community where the aforementioned factors of educational level, high socioeconomic status and orientation toward professional advice are operative.

RECOMMENDATIONS

The preceding discussion has revealed a number of findings which may be useful in improving methods of reaching the pregnant woman and offering her cessation interventions.

1. Pregnant women seem to know that smoking is harmful to health, and most acknowledge that it can be directly harmful to the fetus. This information about the baby's health should be made as specific as possible, and the mother's own health should be intricately interwoven in the theme. Quitting is for the good of both mother and baby, not the baby alone. The harmful aspects of smoking and the benefits of not smoking must be equally emphasized.

2. Mass media, such as television and film, are particularly good avenues for portraying women of varying ethnicity in a number of geographical and socioeconomic settings. Because of gender identification it is important to utilize women as the transmitters of information and advice. Information should be dispensed by as many different sources of contact in the prenatal clinic (or doctor's office) as possible, not solely by the

physician. The awareness of various health professionals should be raised in this regard.

3. Social norms and lay referral systems should be used as part of information dissemination and modeling influences. This is particularly true for women of lower socioeconomic status. It is important to involve the father of the child in the normative belief system and in a direct supportive effort of quitting. This should be particularly timely in an era when more and more couples are experiencing pregnancy and birth as a two-person process.

4. Much more emphasis must be placed on permanent smoking cessation rather than just during the time of pregnancy. Positive aspects of remaining an ex-smoker include better health for the mother and child and the future impact of role modeling as the child grows.

Summary

1. The percentage of 17-18 year old women who smoke has shown a steady rise between 1968 and 1979. It now appears, however, that the increase in smoking prevalence among all 12-18 year old females has leveled off and begun to decline. Young women born after 1962 show a substantially reduced initiation of smoking and will probably have a much lower prevalence of smoking as adults.

2. Those young women who do begin to smoke are starting to smoke regularly at a younger age, with more than half of the male and female adolescents who begin to smoke starting before the 10th grade.

3. The earlier tobacco is used and the greater the number of cigarettes smoked per day, the less likely an attempt to quit will be successful.

4. The percentage of women smokers who smoke more than one pack per day is increasing.

5. Adolescent and adult women are more likely to use low "tar" and nicotine cigarettes, smoke fewer cigarettes per day and inhale less deeply than do men, but the difference between the sexes in these patterns of smoking is decreasing. Adolescent and adult black women are more likely to be smokers than their white peers, but they smoke fewer cigarettes per day.

6. Adolescents from low income families, single parent families, and families with lower parental educational levels are more likely to become smokers.

7. Female and male adolescents are more likely to begin smoking if a parent or older sibling also smokes.

8. Adolescent smokers associate with peers who smoke, and nonsmokers associate with nonsmoking peers.

9. Adolescent girls overestimate the percentage of their peers who smoke and they have a very positive image of the people in cigarette advertisements, but they are less likely than adolescent boys to see smoking as a social asset.

10. Adolescent girls who smoke tend to be more outgoing, but feel less able to influence their future.

11. Adolescents experience stress due to feelings of unattractiveness, incompetency in school achievement and personal relations, limited opportunity for personal growth and concern over future social and economic roles. This stress may be the common mechanism producing the increased rates of smoking in some groups.

12. The factors associated with successful quitting by adolescents of either sex are lower number of cigarettes smoked per day, higher educational aspirations and achievement, greater acceptance of the health risk of smoking, and having more nonsmokers among their friends.

13. It is possible that women and men modify their smoking in order to maintain a constant nicotine level.

14. Women are more likely than men to smoke in order to reduce stress.

15. Women at higher education and income levels are more likely to succeed in quitting. Additional factors associated with successful quitting are a strong commitment to change, the use of behavioral techniques and reliable social support for quitting. Women have been reported to show lower rates than men of successful cessation following organized cessation programs, a difference which is less apparent in those programs that include social support.

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